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Coastal Engineering Research Center

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Summary Results of a Partnering Workshop

Under auspices of the Coastal Engineering Research Board (CERB), hosted by the Corps' South Atlantic Division, a coastal engineering partnering workshop was held on 12 May 1998 in Fort Lauderdale, FL, between the U.S. Army Corps of Engineers and the private sector.

Background and Purpose

A key element of the U.S. Army Corps of Engineers' Coastal Engineering Strategic Plan is the initiative to "Maintain an Openness to New Opportunities." In the early 1990s, Congress gave the Corps authority to partner with U.S. firms in seeking and performing work overseas. Under the leadership of the Chief of Engineers, LTG Joe N. Ballard, acting on this authority is strongly emphasized. Private consultants attending the 63rd meeting of the CERB in San Diego, CA, on 11-12 June 1996, noted that very few firms even know of this opportunity for support by the Corps and recommended that it be given greater attention.

The Corps selected the coastal engineering sector to initiate this increased emphasis on private sector partnering for several reasons:

a. It is a small, but well-defined, subset of the engineering community, within both the Corps and the private sector.

b. The Corps coastal engineering community has been a leader in developing a strategic vision and seeking new opportunities.

c. Holding a partnering workshop in conjunction with a CERB meeting offered an opportunity for many Corps senior leaders and senior executives in the private sector to meet.

At their 66th meeting in New York, 16-17 October 1997, the CERB recommended that a partnering workshop with private firms be held in conjunction with their next meeting in Fort Lauderdale, FL, 12 May 1998. The recommendation was enthusiastically approved by the Corps senior leadership. The purpose of the workshop was to ascertain how the Corps might be of assistance to the U.S. private sector in capturing a larger share of overseas coastal engineering consulting and design work. Examples of such work include design, maintenance or modification of ports, harbors, rubble-mound structures, navigation channels, shore protection, beach fills, and dredging and dredged-material placement. Development of a partnering relationship for coastal-related work also could serve as a model for relationships in other technical areas.

Panel from l-r: Ron Giovannelli, Lon Hachmeister, Jim Lindner, Mike McCarthy, Bob Nichol, Jean Perez, Jim Sigler, Joan Yim

Charles Chesnutt

Jim Sigler

Henry Michel

Structure and Participants

The workshop was organized into three parts: (a) overview of relevant Corps capabilities, (b) presentation of interests and expectations by a panel of private sector representatives, and (c) discussion of implementation issues and dialogue with the audience. Panelists in order of speaking were as follows:

Panelists	Represented Organization
BG Robert L. VanAntwerp, Commander, South Atlantic Division	Corps Districts and Divisions
Mr. Steven L. Stockton, Chief, Engineering Division	Corps Headquarters
Dr. James R. Houston, Director, Coastal and Hydraulics Laboratory	Corps Research and Development
Dr. Robert D. Nichol, President	Moffatt & Nichol Engineers
Mr. Ronald F. Giovannelli, Vice President	Dames & Moore
Mr. Lon E. Hachmeister, Regional Program Director for Water Resources and Energy Program	Foster Wheeler Environmental Corporation
Mr. James T. Lindner, Partner	Han-Padron Associates, LLP
Mr. Michael J. McCarthy, Vice President	Frederic R. Harris, Inc.
Mr. Jean-Yves Perez, President and CEO	Woodward-Clyde Group, Inc.
Mr. James M. Sigler, Senior Manager	Brown & Root, Inc.
Ms. Joan B. Yim, Vice President and Program Manager for Marine Services	Parsons, Brinckerhoff, Quade & Douglas, Inc.
Mr. Donald R. Kisicki, Chief, Office of Interagency and Intergovernmental Support	Corps International Support
Mr. William N. Lovelady, Jr., Chief, Office of Counsel, Waterways Experiment Station	Corps Counsel

Private sector active participants were selected in concordance with recommendations by the American Consulting Engineers Council (ACEC). Each private sector participant was asked to describe (a) his company and its involvement in international coastal work, (b) possible roles for the Corps in facilitating the acquisition of that work, and (c) requirements for Corps involvement in such partnerships.

Corps of Engineers Coastal Capabilities

BG VanAntwerp reviewed the Corps' Civil Works mission areas, which include navigation, flood control, and environmental protection. He pointed out that the Corps already partners with the dredging industry, as the Corps does not do any dredging that can be done by the private sector. Districts have the expertise to conduct studies related to coastal planning, regulatory permitting, digital mapping, dredging and dredged-material-placement sites, beneficial uses of dredged material, water quality, coral reef restoration, forensic engineering, and coastal and wetland restoration. Corps Districts also conduct significant environmental and socioeconomic studies. Districts also use a multitude of numerical simulation models, many of which were developed by the U.S. Army Engineer Waterways Experiment Station's (WES's) Coastal and Hydraulics Laboratory.

Dr. Houston discussed the Corps' research and development (R&D) capabilities and elaborated upon the differences in private sector partnering of foreign and U.S. Government laboratories. He noted that national laboratories overseas such as Delft, DHI, Wallingford, Trondheim, and Manley laboratories routinely support the private sector and, in fact, are often subsidized by their government.

Dr. Houston said that WES can offer significant support in coastal engineering through its renowned staff of engineers and scientists and world-class hydraulic modeling capabilities; high performance computing for numerical simulations; riprap facility; and field research facility at Duck, NC. WES has large-scale facilities for evaluating container

and other commercial ships, naval vessels, and tow and barge systems. The Scanning Hydrographic Operational Airborne Lidar Survey (SHOALS) system is a high-speed airborne hydrographic surveying system that can be deployed worldwide.

Many foreign countries want to develop their water resources, and Dr. Houston stated that the Corps has a proven record in developing major systems in a technically sound and environmentally compatible manner. Consequently, the Corps brings a high level of credibility to international lending agencies because of the engineering and environmental expertise found in the Corps Districts and Laboratories.

Trends in Overseas Work for U.S. Firms

During his luncheon address, **Mr. Henry Michel, Chairman Emeritus, Parsons, Brinckerhoff, Quade & Douglas, Inc.,** elaborated on his belief that the real boundaries are the markets, not national borders. The consulting industry and, in fact, all industries are not international; they are not global; they are borderless. The Corps enjoys a worldwide reputation, and its engineers represent a major source for specialty support in many areas. The Corps is well known as a client of private industry, as a contracting agency, and as a reviewer of private industry work efforts. But the private sector has not thought of the Corps as a partner. Many in the private sector are concerned that another competitor is being created or that another member is being added to what may appear to be an unwieldy team. But that thinking is parochial and shortsighted. Since overseas clients in the coastal engineering sector are invariably government agencies or entities, they may feel more comfortable if a governmental entity is part of the team.

Regarding coastal work, Mr. Michel said to not forget that every river has two coasts and that river transport is the largest transport sector in the world today. China has 17,000 km of coastline.

BG Robert "Van" VanAntwerp addressing the group

From l-r: LTC Tom Peck, Jerry DeChiara, George Strain, Ed Middleton, John Harrison

From l-r: Lon Hachmeister, Jim Lindner, Mike McCarthy

Bill Lovelady

All of southeast Asia, with very inadequate land-transport systems, is heavily dependent on waterborne transport. Waterfront facilities are essential. An additional explosive business area for coastal engineering is the creation of land, especially artificial islands for airports. American companies should examine the value they can add to their proposals by bringing along the specialized experience and expertise in navigation, river-basin and flood-plain management, dredging and control of contaminated sediments, and many of the environmental issues that the Corps can provide. Mr. Michel also emphasized the additional competitiveness and credibility a U.S. Government entity can bring to a private sector team. He stated that the private sector needs the U.S. Government to change the laws to make overseas work more competitive.

Industry Interest and Expectations

Mr. Giovannelli said the first area that should be considered is supplementing private sector staff with Corps personnel because no firm can be as deep technically as the Corps. Second, if a project (e.g., port or harbor) has a component absolutely essential to winning the contract (e.g., three-dimensional numerical circulation model) for which the Corps has renowned capabilities, then the Corps could execute that entire component. Mr. Giovannelli emphasized that the Corps must comply with consultant-type requirements for budget, schedule, and deliverables.

Mr. Hachmeister stated that the ability to say, "We are working with one of the largest national labs in the United States," would make a significant difference in credibility. Many developing countries need coastal-zone management, and one of the specialties of the Corps is coastal engineering.

Mr. Lindner said there are many areas where private industry, regardless of size, can work. It is necessary only to work out the details of doing so.

Mr. McCarthy expressed concern about how to team and provide upfront funds for Corps participation. He noted that costs for engineering services often are not fully recovered until the construction-management phase of a project. He also said the Corps would bring a level of expertise not ordinarily available, even though the private sector has generalized experience.

Mr. Perez said it would be a great advantage to have access to Corps personnel, since their reputation is tied directly to the good reputation of the Corps. Mr. Perez said true partnering would require legislation allowing the Corps to respond to many of the private sector requirements.

General audience

Mr. Sigler stated that the Corps is the only place in the United States where he can acquire inland waterway development expertise.

Ms. Yim recommended that the Corps leverage its position as a U.S. Government agency with the Asia-Pacific Economic Cooperation (APEC) group. APEC is different from other international bodies because the private sector is a full partner, and the Corps could provide expertise in areas such as coastal engineering that may need support.

Mr. Nichol, as Chairman of the Panel, asked **Mr. John Headland** to speak for his firm. Mr. Headland said foreign R&D laboratories receive funding to promote business abroad and have products specifically tailored for the international marketplace. Their models are not more sophisticated mathematically than those of the Corps, but they have already penetrated the market in many parts of the world. Mr. Headland said he would rather come to WES than to a foreign lab, but the Corps must make it easier for him to do so.

Partnership Implementation

Messrs. Kisicki and Lovelady presented the two mechanisms currently available to implement partnerships with the Corps. The Technical Assistance Program (TAP) is an authority that allows the Corps to provide reimbursement services to U.S. firms competing for or executing work overseas. Such firms must be incorporated within the United States. The firm must certify that services provided by the Corps are not reasonably and expeditiously available elsewhere. The Corps must receive funds in advance of an obligation, although the funding can be phased. The Corps cannot be held liable for the work. Both issues, advance of funds and freedom from liability, are prescribed by statute and require legislation to change. District Commanders and Laboratory Directors are authorized to sign TAP agreements, and the private sector is free to approach the Corps office that has the required resources. Reimbursement for Corps help in preparing a proposal can be provided through a TAP.

From l-r: Jim Houston, Steve Stockton, BG Robert "Van" VanAntwerp

The Director of a Federal Laboratory also can sign a Cooperative Research and Development Agreement (CRADA) between that Laboratory and one or more private parties. CRADAs are used to conduct R&D for mutual benefit of the government and the private party or for the sole benefit of the private party if consistent with the Laboratory mission. Services provided by the Laboratory can include personnel, equipment, facilities, intellectual property, and other resources, but not funding; the services cannot be reasonably or expeditiously available from the private sector. The CRADA must receive final approval, disapproval, or modification from the Department of the Army within 30 days.

Conclusions

The following is a summary of the conclusions drawn by the workshop participants:

Congress has given the Corps authorities that allow partnering with private U.S. firms in seeking and performing work overseas. However, legislative changes or enhancements are required for this partnering initiative to grow. While the Corps strongly desires to help private interests succeed in capturing a larger share of overseas planning, design, and construction,

Joan Yim

Jean Perez

partnering also will directly benefit the Corps. Partnering will broaden the Corps' expertise through experience on a wider range of projects and by collaborations directly with U.S. firms. This expertise is required to meet existing civil and national defense missions. The private sector sees the reputation, integrity, and specialized staff of the Corps as potentially significant in capturing a larger share of overseas coastal engineering consulting and design work. The private sector can come to any Corps office for assistance.

Statutes require the Corps to receive upfront funding for private sector work, but the effort may be broken down into specific tasks. Advanced payments are then made for each task. The TAP allows the Corps to support U.S. firms seeking or executing work overseas. CRADAs allow the Corps to work with any organization on activities that support research and development. Corps Districts and Laboratories are authorized to sign Technical Assistance Agreements with private firms for overseas work, including helping prepare work proposals with reimbursement. CRADAs require final approval from the Department of the Army within 30 days.

To be true partners, the Corps and the private sector should work under the same set of rules. Budget, schedule, and deliverables must have the highest priority. Presently, the Corps cannot be held liable for their deliverables, and this may be unacceptable to potential partners.

The private sector participants recommended that new legislation or authority be sought to provide some funding for the Corps to assist private companies in "upfront" activities such as strategy sessions, proposal development, and contract negotiations.

The private sector representatives recommended that the ACEC form a committee with the Corps to work toward obtaining legislation to make the Corps more attractive for partnering and international work. The committee should include representatives from the consulting and construction communities, including dredging. The Association of General Contractors and the Construction Industry Presidents' Forum also should be included.

In closing, BG VanAntwerp stated, "We want to convey results of this meeting to our Board of Directors at the Headquarters, U.S. Army Corps of Engineers, to make sure this is the direction our Chief wants to go. We are pretty certain that it is. Let's get out there and market for your sake and for our sake." In concluding remarks for the private sector, the panel chairman, Mr. Nichol, said, "We stand behind it. The consulting groups, the consulting engineers, the ACEC, and those who happen to be here that aren't members of the ACEC—most of us are—, we really stand behind you."

Further Action

Committees will be formed with help of the Corps, ACEC, and other appropriate organizations to resolve issues to make the Corps more available for partnering and international work.

Regional Sediment Management

The 67th Meeting of the Coastal Engineering Research Board (CERB) was held 13-14 May 1998 in Fort Lauderdale, FL, hosted by the South Atlantic Division of the Corps of Engineers. The CERB consists of four military members (MG Russell Fuhrman, President and Director of Civil Works, Headquarters; MG Jerry Sinn, Commander, North Atlantic Division; BG Richard Capka, Commander, South Pacific Division; and BG Robert VanAntwerp, Commander, South Atlantic Division) and three civilian members (Dr. Robert Dean, University of Florida; Dr. Billy Edge, Texas A&M University; and Dr. Richard Sternberg, University of Washington). The theme of the meeting was "Regional Sediment Management." In addition to the 7 CERB members, 47 Corps personnel, and 6 invited guest speakers in attendance, 60 guests were present, reflecting the growing interest in treating dredged material and beach sediments on a regional-management instead of a project-specific basis.

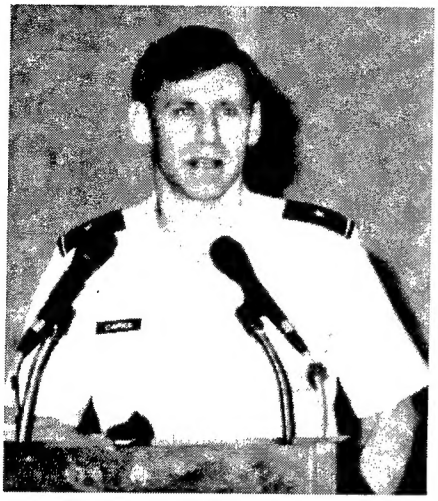
Sediment Management Overview

Dr. James Houston, Director, U.S. Army Engineer Waterways Experiment Station (WES), Coastal and Hydraulics Laboratory, and Moderator of the "Regional Sediment Management" panel discussion, pointed out that ideally the Nation's coasts would be a balanced, continuous, natural system. In actuality, society's activities have affected virtually all coasts. Many Corps' navigation projects were constructed without knowledge of possible regional impacts. Large jetties, deep channels, and sand management practices can be detrimental to beaches many miles from the project and across many political boundaries.

While the Corps has traditionally had a project focus, interest is increasing in considering coastal problems on a regional basis to understand the complete effects a project will have before it is constructed. The Water Resources Development Act of 1996 authorizes the Corps to "...cooperate with any State in the preparation of a comprehensive State or regional plan for the conservation of coastal resources located within the boundaries of the State." There also is increasing awareness that sediment is a valuable resource, and it should be carefully managed as such. Corps policy directs that "District engineers should identify and develop dredged material disposal management strategies that satisfy the long-term (greater than

CERB Board: MG Jerry Sinn, Dr. Billy L. Edge, BG J. Richard Capka, Dr. Robert L. Dean, MG Russell L. Fuhrman, Dr. Richard W. Sternberg, and BG Robert L. "Van" VanAntwerp

Board from l-r: Dr. Edge, BG Capka, Dr. Dean, MG Fuhrman, Dr. Sternberg, MG Sinn, BG VanAntwerp



BG Rick Capka

Orville Magoon

10 years) needs for Corps projects. Full consideration should be given to all practicable alternatives including upland, open water, beach nourishment, within banks disposal, ocean disposal, etc." Dr. Houston added that, in developing maintenance strategies, the Corps must comply with State water quality standards and with Federally approved coastal-zone programs.

Sand Rights

Mr. Orville Magoon, President, Coastal Zone Foundation, and Dr. Billy Edge, Professor of Ocean Engineering, Texas A&M University, and CERB member, discussed the need for a body of laws and regulations to protect the right of sand to travel and migrate along the coast. They also believe that a study is needed of national coasts to quantify sources and sinks of coastal sand, causes of beach erosion, and allocation of responsibility where appropriate. Although the impact of an individual action may be difficult to quantify, the cumulative effect of many actions is often seen to be catastrophic. Coastal remedial works have usually focused on the immediate reach of coast affected and did not address the basic cause of the problem—the lack of sand supply to the coast.

Several years ago, California was issuing or honoring permits to mine sand from riverbeds, and such mining is still taking place in some locations. In Monterey Bay, mining on the coast itself has stopped but is continuing a short distance back from the coast. At the Santa Ana River, California, flood-channel improvement project, the main stem project placed about 1.3 million cu yd of excavated sand into the littoral zone. This was controversial because it cost more as opposed to letting the construction contractor do what he wished with the material. Some flood control projects will allow the construction contractor to do what he wishes with the fine aggregate, and sometimes they sell it, which results in lower project costs.

Fire Island Inlet to Montauk Point, New York

Ms. Lynn Bocamazo, Corps New York District, and Ms. Julie Rosati, WES, discussed the Fire Island Inlet to Montauk Point (FIMP) comprehensive reformulation study and systemic analysis to identify and evaluate long-term solutions for storm-damage reduction along the south shore of Long Island, New York. The project area, located along the Atlantic Coast of Suffolk County, is approximately 83 miles in length, comprising about 70 percent of the total ocean frontage of Long Island, and is characterized by barrier islands, transitional beaches, and headlands in addition to three Federal inlets and over 200 miles of back-bay shoreline. Sediment management at a full range of spatial and temporal scales is a primary

concern of the reformulation effort. Past efforts in the 1970s were deemed unacceptable by the Council on Environmental Quality because the original study did not look at a wide range of alternatives, nor did it treat the project area as a complete system.

The adopted plan for FIMP must take a holistic approach to individual engineering solutions, recognizing the interrelationship between littoral transport patterns, sediment budget, inlet dynamics, and inland bays. Current studies focusing on sediment management include (a) a comprehensive shoreline-change analysis and sediment budget, (b) a regional geomorphic analysis, (c) computation of breaching and overwash locations and quantification of sediment volumes that enter the back bays, (d) a study of inlet bypassing at Shinnecock, Moriches, and Fire Island inlets, (e) cooperative efforts with the U.S. Geological Survey to identify suitable sand sources, (f) an analysis of large-scale sand waves or undulations along the project area shorelines, and (g) numerical modeling of shoreline change and storm-induced erosion. Results will be integrated into a comprehensive sediment-management plan for final project designs.

Lynn Bocamazo

Nick Kraus

Jim Murley

Julie Rosati

BG Robert "Van" VanAntwerp addressing Board (in background)

Ocean City/Assateague Island, Maryland, Studies

Mr. Gregory Bass, Corps Baltimore District, discussed the history of Ocean City Inlet, Maryland, and its impacts on the adjacent barrier islands and presented the portion of the Ocean City Water Resources Study (OCWRS) that focuses on developing a long-term restoration project for Assateague Island. Ocean City Inlet was formed by a hurricane on 23 August 1933 and separated a continuous barrier island into Fenwick Island to the north and Assateague Island to the south. The inlet was stabilized with jetties from 1933 to 1935. Shoreline-change rates for Assateague Island more than doubled from a preinlet erosion rate, while the shoreline-erosion rate of Fenwick Island has been relatively constant.

Analyses of sediment-transport processes indicate that the Ocean City jetty and inlet system have indeed impacted northern Assateague Island. Numerous alternative solutions were evaluated and a plan identified that will mitigate for impacts caused by construction of the jetties. The plan involves both

short- and long-term restoration. The short-term plan includes placing approximately 1.8 million cu yd of sand on Assateague Island from Great Gull Bank, an offshore shoal. A low storm berm will be constructed to an elevation of +10.8 ft National Geodetic Vertical Datum in the portion of the beach between 1.6 and 6.2 miles south of the inlet. The placement will be configured such that the impacts to piping plovers, a threatened species, is minimal, and the integrity of the island is restored.

Because the jetties and inlet will continue to disrupt sediment-transport processes along northern Assateague Island, a long-term sand-placement plan for the island must also be implemented. The goal of the long-term plan is to restore a supply of sediment to Assateague Island that would have naturally occurred if the Federal navigation project did not exist.

East Pass, Florida, Project Management

Mr. Howard Whittington, Jr., Corps Mobile District, discussed management of the East Pass Inlet project that is located on the Florida panhandle in Destin, approximately 40 miles east of Pensacola and 60 miles west of Panama City. The inlet connects the Gulf of Mexico with the Choctawhatchee Bay. The Federal project consists of a navigation channel through the pass, two jetties (east and west), and a spur groin that helps control the thalweg through the inlet and prevents erosion of the east jetty. A spit of sand in the inlet is called Norriego Point.

A number of challenges face the Corps at East Pass. One is transport along the beachfront and across the ebb shoal. A controversy also exists over the direction of net drift. The Corps must dredge about 100,000 cu yd per year from the inlet. If Norriego Point eroded, wave energy could affect the island harbor for the city of Destin. Some tendency for the thalweg to move back to the east toward its old traditional position is probable. Shoreline

Greg Bass

movement and jetty stability are also concerns.

The Scanning Hydrographic Operational Airborne Lidar Survey (SHOALS) system is an airborne laser surveying and mapping system capable of both hydrographic and topographic surveying. East Pass has been surveyed by SHOALS four times in the last 4 years, very economically and rapidly. These surveys allow the Corps to do a comprehensive analysis of the entire inlet system. Data are being used to better quantify changes from year to year, which will result in better management decisions for project operation and maintenance.

Beach Nourishment at Orange County, California

Mr. Arthur Shak, Corps Los Angeles District, described the development of the southern California basin beginning at the turn of the century and explained the importance of periodic beach nourishment in supporting an unsteady supply of sediment to the coast as a result of man-made influences. These influences include the Los Angeles/Long Beach breakwaters and harbor complex; 14 miles of breakwater, jettied entrances, and harbors at Alamitos Bay, Anaheim Bay, and Newport Bay; closing the inlet at Bolsa Chica Lagoon; flood-control works on all three rivers; groins at Long Beach, Seal Beach, Surfside, and Newport Beach; piers at Long Beach, Seal Beach, and Huntington Beach; and mineral extraction.

In 1962, a Beach Erosion Control Study found erosion along northern Orange County caused in part by natural events and in part by Federal structures. The report recommended a comprehensive plan that would provide protection to the shore. Elements of the plan include a protective beach at Surfside and Sunset Beach, a detached breakwater just upcoast of the Newport fishing pier, and periodic beach nourishment. The initial protective beach at Surfside-Sunset Beach was completed in 1964 and has been renourished eight times since, for a total fill volume of about 14.2 million cu yd. The detached breakwater was deferred, and a groin field was created at west Newport Beach.

Regional studies of coastal processes were conducted by the Coast of California Study for Orange County. Definitive conclusions of the prevailing coastal processes are not obvious; however, the trends in location of the mean high-water line, beach volume, and profile volume shoreward of the -20-ft mean lower low-water (mllw) contour all indicate the effectiveness of the protective beach and periodic nourishment in creating wider beaches and a greater volume of sand in the surf

Wayne Stroupe

zone. In 1995, about 7.6 million cu yd more sand was located in the profile volume than in 1963. In that same time interval, about 16.1 million cu yd of beachfill volume was placed and sediments delivered to the shore from the Santa Ana River. The nearshore seaward of the -20-ft mllw contour shows a general deepening trend, with changes seen occurring as far out as -40 ft mllw.

Coast of Florida Erosion and Storm Effects Study

Mr. Charles Stevens, Corps Jacksonville District, discussed the Coast of Florida study, the most comprehensive shore protection study ever undertaken by the State of Florida (Florida Department of Environmental Protection (DEP)) and the Jacksonville District. The study was initiated in June 1988 to investigate coastal processes along the State's coastline on a regional basis and make recommendations regarding modifications for existing shore protection and navigation projects. The authorization for the study required that a comprehensive body of knowledge, information, and data on coastal processes along Florida's coastline be developed. The study area was divided into five coastal regions. The 92 miles of shoreline in Palm Beach, Broward, and Dade counties was the first region (Region III) studied because of the large financial commitment in State and Federal funds for shore-protection projects in the area.

The feasibility report and Environmental Impact Statement for Region III were completed in November 1996. A sand-transfer plant at Lake Worth Inlet was authorized by Section 101 of the Water Resources Development Act of 1996 as a result of the feasibility report. The Geographic Information System coverages for Region III data are being made available by the Florida DEP via the Internet (www.dep.state.fl.us/water/beaches). The Region IV study was initiated in October 1991; however, the study is not funded for continuation. Carry-over funds are being utilized to conclude current study efforts in Fiscal Year 1998. A strategic management plan is being prepared in response to the State's request to evaluate the best management practices on the use of sand resources along the Atlantic coast of Florida.

Jacksonville District is looking at all the material dredged in the coastal area, including upland disposal sites along the Intracoastal Waterway, some of which are reaching their capacity. Port authorities are offering this material for use on the beach. The Jacksonville District will consider every possible disposal-site option as far inland as the mainland side of the Intracoastal Waterway.

Jay Lockhart, who recently retired after 37 years of service with the U.S. Army Corps of Engineers, was recognized by the Coastal Engineering Research Board (CERB) for his contributions to the Corps' coastal-engineering programs. MG Russell L. Fuhrman, CERB President and Corps Director of Civil Works, stated that Jay has been both a personal friend and professional colleague and has contributed his vast knowledge for many years. An accompanying plaque read "To John Jay Lockhart, Jr., in appreciation of exceptional dedication and contributions to the field of coastal engineering and the Coastal Engineering Research Board from 1968 to 1997." Mr. Lockhart began his Corps service as a hydrologist with the Fort Worth District in 1960. By promotion and transfer, he moved to the Jacksonville District in 1965 where he began his coastal-engineering career and to the South Atlantic Division in Atlanta in 1967. He moved to Corps Headquarters in Washington, DC, in 1979 where he performed engineering review of coastal projects nationwide until his retirement. Jay was a tremendous supporter of coastal-engineering research.

Coastal Engineering Education Program

Background

As the Nation's Coastal Engineer, the Corps of Engineers recognizes the necessity for maintaining highly qualified coastal engineers to meet present and future challenges in this critical mission area. To meet this need, a unique course of study has been developed, coupling the staffs and facilities of the U.S. Army Engineer Waterways Experiment Station (WES) and Texas A&M University (TAMU). Although the program was developed for Corps professionals, the curriculum is equally applicable to other government agencies and the private sector. Consequently, all qualified individuals are considered for admission.

Description of the Program

The 1-year program is designed to provide students with the basic academic coursework and practical training essential for solving modern-day, coastal-engineering problems. The program is offered through the WES Graduate Institute jointly by the Coastal and Hydraulics Laboratory (CHL) and TAMU. A Master of Engineering (ME) degree is awarded by TAMU upon successful completion of the program, although some students may prefer to enroll in the Master of Science (MS) degree program. Requirements to complete the MS deviate slightly from those described herein.

Students spend the fall semester in College Station, TX, and the spring semester in Vicksburg, MS, followed by a brief visit to the CHL Field Research Facility (FRF) in Duck, NC, during the period between the spring semester and the summer session. The 10-week summer session is spent in Vicksburg.

Admission Requirements

Applicants must be accepted into the TAMU Ocean Engineering Program. The applicant must have (a) a Bachelor of Science (BS) degree in engineering from an accredited institution or approval of the TAMU Ocean Engineering Program if the BS degree is other than engineering, (b) a satisfactory scholastic record that gives evidence of the applicant's ability to perform successful graduate-level work, and (c) acceptable scores on the Graduate Record Examination (GRE). International students are required to obtain an acceptable score on the Test of English as a Foreign Language (TOEFL) exam. The GRE and TOEFL exams should be taken in the fall of 1998, and application to TAMU must be made by March 1999.

In addition to the general admission requirements specified in the TAMU Graduate Catalog, all applicants are expected to have a sufficient background in mathematics including differential equations and numerical methods, basic engineering science, statics and dynamics, mechanics of materials, and at least one semester of fluid mechanics. Because of the time limitations and relatively rigid curriculum required by this 1-year program, applicants with insufficient background will not be accepted.

Degree Requirements

The Master of Engineering degree requires a minimum of 36 credit hours of course work. As shown in the schedule, the WES/TAMU program requires 37 credit hours for successful completion. Approximately one-third of the required hours are taken in fields outside the student's major field. Students take six credit hours of 685 (Problems) and submit one or two written reports on topics deemed important in coastal or ocean engineering. Topics are selected with the student's advisors. Each student has advisors from WES and TAMU.

WES Graduate Institute

The WES Graduate Institute is an association of universities and WES where students can earn academic credit and graduate degrees from member universities through coursework offered at WES. Current member universities include TAMU, Mississippi State University, and Louisiana State University. The Institute was established in 1986 to support graduate study and research in scientific and technological areas of interest to WES and other Corps of Engineers organizations.

TAMU Ocean Engineering Program

TAMU is a pioneer in ocean and coastal engineering education. Relatively few universities in this country offer an ocean-engineering curriculum, and TAMU is recognized nationally and internationally as having one of the best programs. The Ocean Engineering Program offers both undergraduate and graduate degree programs. Nearly 400 undergraduate and 250 graduate students have graduated from the program since it was established in 1973. The program was selected by the U.S. Navy Civil Engineer Corps for graduate training of their officers in the area of ocean engineering. Several WES employees have also elected to receive their PhD training at TAMU. Because of its expertise in ocean and coastal engineering, TAMU was chosen to be responsible for the WES Graduate Institute Ocean and Coastal Engineering Programs. Previous Coastal Engineering Education Programs have been very successful, resulting in

14 students earning Master of Engineering degrees.

Coastal and Hydraulics Laboratory

In 1996, the WES Coastal Engineering Research Center merged with the Hydraulics Laboratory to form the Coastal and Hydraulics Laboratory (CHL). CHL is the largest water resources laboratory in the world with approximately 200 engineers and scientists, one-fourth holding doctorates. CHL has an unequaled combination of experimental and field-research facilites and a staff with broad expertise to conduct studies of diverse and complex problems in the coastal zone. The capabilites of CHL are greatly broadened by facilities such as the High Performance Computing Center and by the expertise of employees in the four other technical laboratories located at WES.

For More Information, Contact the following:

At WES, Dr. C. H. Pennington, Director, WES Graduate Institute, U.S. Army Engineer Waterways Experiment Station, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199, phone (601) 634-3549, fax (601) 634-4180. At TAMU, Dr. Billy L. Edge or Dr. Robert E. Randall, Ocean Engineering Program, Texas A&M University, College Station, TX 77843-3136, phone (409) 847-8712 or (409) 845-4515, fax (409) 862-1542.

Coastal Engineering Education Program Schedule (1999–2000)

Course Number	Course Title	Credits	Location
Fall Semester 1999			
MATH 601	Higher Mathematics for Engineers and Physicists	4	TAMU
OCEN 671	Ocean Wave Mechanics	3	TAMU
OCEN 674	Ports and Harbors	3	TAMU
OCEN 688	Marine Dredging	3	TAMU
OCEN 681	Seminar	1	TAMU
OCEN 685	Problems	1	TAMU
Spring Semester 2000			
OCNG 608	Physical Oceanography	4	WES
OCEN 672	Coastal Engineering	3	WES
OCEN 685	Numerical Modeling	3	WES
CVEN 679	Theory of Fluid Mechanics Models	3	WES
OCEN 681	Seminar	1	WES
OCEN 685	Problems	1	WES
Summer Session 2000 (10 weeks)			
OCEN 678	Hydromechanics	3	WES
OCEN 682	Coastal Sediment Processes	3	WES
OCEN 685	Problems	1	WES
Total Credit Hours		**37**	

Coastal Inlets Research Program Workshops

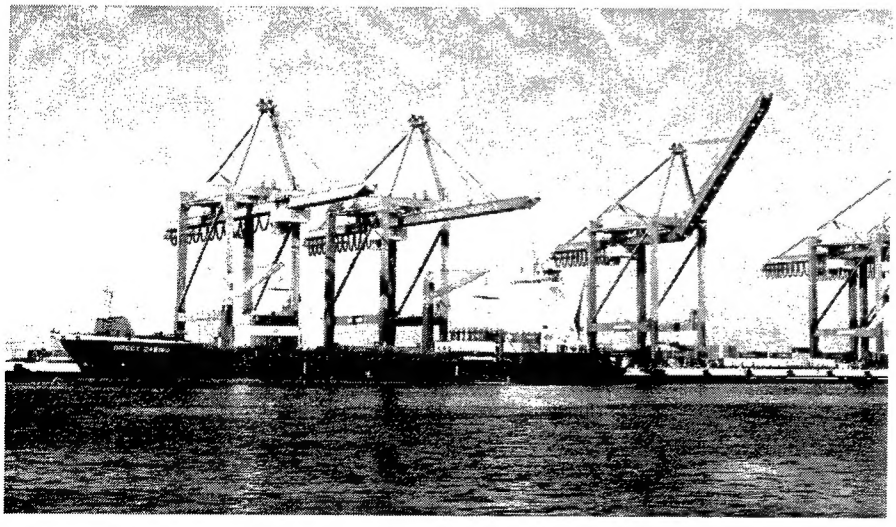
by Nicholas C. Kraus, Research Physical Scientist, U.S. Army Engineer Waterways Experiment Station, Coastal and Hydraulics Laboratory, Vicksburg, MS

Recognizing that training funds in the Corps' Districts are limited, investigators of the Coastal Inlets Research Program (CIRP) "took the show on the road" from the Waterways Experiment Station during the week of November 16-20, 1998, and conducted two coast-to-coast workshops. The CIRP is comprised of six research work units, and its mission is to develop technology to reduce the cost of operating and maintaining Federal inlet navigation channels in a systems approach that includes the adjacent beaches. The six technical work units, with selected major products, are as follows:

- **Inlet Channels and Adjacent Shorelines.** Automated coastal-sediment budget system, shoreline change numerical model for inlets
- **Inlet Modeling System.** Interconnected numerical models of tidal circulation, random waves, and sediment transport
- **Inlet Geomorphology.** Empirical predictive formulas for inlet morphology change; data sets
- **Scour at Inlets.** Techniques for predicting and mitigating scour, including the associated hydrodynamics
- **Laboratory Investigation of Inlet Processes.** Physical modeling of inlets; data sets on combined waves, currents, and morphology change
- **Field Data Collection at Inlets.** Procedures for collecting data at inlets; data-analysis toolboxes; field data sets

A seventh work unit is responsible for technology transfer and CIRP coordination and management.

Participants at the East Coast workshop listening to a presentation on inlet sediment budgets



Observing cargo unloading at Los Angeles Harbor

The East Coast workshop, hosted by the Philadelphia District, took place November 16-17 at Avalon, NJ, along the south New Jersey shore. The 18 participants came from the Baltimore, Jacksonville, New York, Philadelphia, and Savannah Districts; the North Atlantic Division; the Naval Research Laboratory; and consulting firms. Presentations on New Jersey Inlets and Indian River Inlet, Delaware, were given by Jeff Gebert and John McCormick of the Philadelphia District, and on the inlets of Long Island, New York, by Lynn Bocamazo of the New York District. Technical tours followed of Hereford, Corson, Townsend, and Great Egg Inlets, New Jersey.

The West Coast workshop, hosted by the Los Angeles District, took place November 19-20 at Redondo Beach, CA, close to the Port of Los Angeles. The eight participants came from the Los Angeles, Mobile, San Francisco, and Portland Districts, and consulting firms. Art Shak of the San Francisco District gave a presentation on southern California Federal inlets and lagoon environmental restoration projects involving small existing inlets and a new inlet that is planned to be cut. Bradd Schwichtenberg and Jane Grandon of the Los Angeles District led a boat tour of Los Angeles-Long Beach Harbor and the Pier 400 construction.

The purpose of the CIRP workshops was to brief Corps District personnel on recent developments

in coastal inlets research, with focus on transfer of numerical models to the field. Subjects covered included formulation of sediment budgets for inlets and their uncertainty; the random wave model STWAVE with wave-current interaction; the tidal circulation model ADCIRC with flooding and drying; scour at inlets; inlet geomorphology and stability criteria; and advances in field-data collection and data management for inlets and navigation channels. Recently published and draft CIRP Coastal Engineering Technical Notes served as the basis for many presentations and were distributed to participants as documentation. CIRP investigators, in turn, received feedback on District needs and on features of the software demonstrated.

This workshop on the road benefited from the power of laptop computers, by which CIRP investigators demonstrated and gave lessons on the numerical models. Several hours of hands-on time were scheduled during each workshop to allow participants to work with the models and their interfaces. Major CIRP models are being released in the Surface-Water Modeling System (SMS), which is available to Corps of Engineers users under the Model-Maintenance Program. Wave and tidal circulation models have been applied by CIRP investigators at Ponce De Leon Inlet, Florida; Shinnecock Inlet, New York; Willapa Bay, Washington; and other sites. Other models, such as the analysis toolboxes, and the Sediment Budget Analysis System are being released both individually and as a collection under the name "Coastal Inlet Management Package" or CIMP.

For further information on the Coastal Inlets Research Program, please contact Mr. E. Clark McNair, Program Manager, at (601) 634-2070 or at *mcnairc@ex1.wes.army.mil* or contact Dr. Nicholas C. Kraus, Technical Leader, at (601) 634-2016 or at *n.kraus@cerc.wes.army.mil.*

Dr. Adele Militello of CHL developing an ADCIRC grid with Joe Gurule of the Jacksonville District and Carol Coch of the North Atlantic Division

Touring Pier 400 construction at Los Angeles

Jarrell Smith of CHL demonstrating STWAVE to East Coast participants

East Coast participants on the terminal groin at Herford Inlet, New Jersey

US Army Corps of Engineers
Waterways Experiment Station

The Corps' Coastal Vision Statement

We will, as the National Coastal Engineer:

- **Continue our leadership in the protection, optimization, and enhancement of the Nation's coastal zone resources.**
- **Increase our contribution to the Nation's economy, quality of life, public safety, and environmental stewardship.**

The CERCular

Coastal Engineering Research Center
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http://bigfoot.cerc.wes.army.mil/CERC_homepage.html

Contributions of pertinent information are solicited from all sources and will be considered for publication. Communications are welcomed and should be addressed to the U.S. Army Engineer Waterways Experiment Station, Coastal and Hydraulics Laboratory, ATTN: Dr. Lyndell Z. Hales, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199, or call (601) 634-3207, FAX (601) 634-4253, Internet: l.hales@cerc.wes.army.mil

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